(10) Materials, such as glass reinforced resins not meeting ASTM F1173 or other plastics, may be authorized by the Commandant (G–MSE) if full mechanical and physical properties and chemical description are furnished. Flammability of the material must be determined by the standard test methods ASTM D635 and ASTM D2863. The average extent of burning must be less than 0.394 inches (10mm), the average time of burning must be less than 50 seconds, and the limiting oxygen index must be greater than 21.

(11) Plastic piping intended for an accommodation area, a service area, or a control station must comply with the standard for the spread of flame or smoke established by Commandant (G–MSE).

(b) *Plastic pipe-vital service.* Plastic pipe may be used for vital fresh and salt water service, subject to the limitations for nonvital service in paragraph (a) of this section, and the following:

(1) Vital machinery served by plastic piping must be duplicated by equivalent machinery served entirely by conventional metallic piping unless allowed otherwise by this section. When such machinery is in separate watertight compartments, or is located or insulated so that damage to both by a single localized fire is unlikely, both may be fitted with plastic piping. (The Marine Inspector will make the final determination as to the adequacy of the separation between duplicate machinery installed in the same watertight compartment.) In no case may failure of plastic piping on one set of machinery affect the operation of the other machinery. Alternatively, a single set of machinery may be installed with parallel, but independent, piping systems, one of plastic and the other of metallic materials. Where metallic piping is required to duplicate or parallel plastic piping, failure of the plastic piping must not interfere with the proper operation of the metallic piping or of the machinery it serves.

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Subpart 56.65—Fabrication, Assembly and Erection

§56.65–1 General (replaces 127 through 135.4).

(a) The requirements for fabrication, assembly and erection in subparts 56.70 through 56.90 shall apply in lieu of 127 through 135.4 of ANSI–B31.1. Those paragraphs reproduced are so noted.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970]

Subpart 56.70—Welding

§56.70–1 General.

(a) The following generally applies to all types of welding, such as stud welding, casting repair welding and all processes of fabrication welding. Where the detailed requirements are not appropriate to a particular process, alternatives must be approved by the Marine Safety Center.

[CGD 77–140, 54 FR 40614, Oct. 2, 1989]

§56.70–3 Limitations.

Backing rings. Backing strips used at longitudinal welded joints must be removed.

[CGD 73–254, 40 FR 40165, Sept. 2, 1975]

§56.70–5 Material.

(a) *Filler metal.* All filler metal, including consummable insert material, must comply with the requirements of section IX, ASME Boiler and Pressure Vessel Code and §57.02–4 of this subchapter.

(b) *Backing rings.* When metallic backing rings are used they shall be made from material of weldable quality compatible with the base metal, whether subsequently removed or not. When nonmetallic backing rings are used they shall be of material which does not deleteriously affect either base or weld metal, and shall be removed after welding is completed. Backing rings may be of the consumable insert type, removable ceramic type, of solid or split band type. A ferrous backing ring which becomes a permanent part of the weld shall not exceed 0.05 percent sulphur. If two abutting surfaces are to be welded to a third member used as a backing ring and one or two of the three members are ferritic and the other member or

members are austenitic, the satisfactory use of such materials shall be determined by procedure qualifications.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 73–254, 40 FR 40165, Sept. 2, 1975]

§ 56.70–10 Preparation (modifies 127.3).

(a) *Butt welds (reproduces 127.3.1*)—(1) *End preparation.* (i) Oxygen or arc cutting is acceptable only if the cut is reasonably smooth and true, and all slag is cleaned from the flame cut surfaces. Discoloration which may remain on the flame cut surface is not considered to be detrimental oxidation.

(ii) Butt-welding end preparation dimensions contained in ANSI–B16.25 or any other end preparation which meets the procedure qualification requirements are acceptable.

(iii) If piping component ends are bored, such boring shall not result in the finished wall thickness after welding being less than the minimum design thickness. Where necessary, weld metal of the appropriate analysis may be deposited on the inside or outside of the piping component to provide sufficient material for machining to insure satisfactory fitting of rings.

(iv) If the piping component ends are upset they may be bored to allow for a completely recessed backing ring, provided the remaining net thickness of the finished ends is not less than the minimum design thickness.

(2) *Cleaning.* Surfaces for welding shall be clean and shall be free from paint, oil, rust, scale, or other material which is detrimental to welding.

(3) *Alignment.* The inside diameters of piping components to be joined must be aligned as accurately as practicable within existing commercial tolerances on diameters, wall thicknesses, and out of roundness. Alignment must be preserved during welding. Where ends are to be joined and the internal misalignment exceeds 1/16-inch, it is preferred that the component with the wall extending internally be internally trimmed (see Fig. 127.3.1) so that adjoining internal surfaces are approximately flush. However, this trimming must not reduce a piping component wall thickness below the minimum design thickness and the change in the contour may not exceed 30°.

(4) *Spacing.* The root opening of the joint shall be as given in the procedure specification.

(b) *Fillet welds (modifies 127.3.2).* In making fillet welds, the weld metal must be deposited in such a way as to obtain adequate penetration into the base metal at the root of the weld. Piping components which are to be joined utilizing fillet welds must be prepared in accordance with applicable provisions and requirements of this section. For typical details, see Figures 127.4.4A and 127.4.4C of ANSI B31.1 and Figure 56.30–10(b) of this part. See § 56.30–5(d) of this part for additional requirements.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970; CGD 73–254, 40 FR 40165, Sept. 2, 1975; CGD 77–140, 54 FR 40614, Oct. 2, 1989]

§ 56.70–15 Procedure.

(a) *General.* (1) Qualification of the welding procedures to be used, and of the performance of welders and operators, is required, and shall comply with the requirements of part 57 of this subchapter.

(2) No welding shall be done if there is direct impingement of rain, snow, sleet, or high wind on the piping component weldment.

(3) Sections of pipe shall be welded insofar as possible in the fabricating shop. Prior to welding Class I piping or low temperature piping, the fabricator shall request a marine inspector to visit his plant to examine his fabricating equipment and to witness the qualification tests required by part 57 of this subchapter. One test specimen shall be prepared for each process and welding position to be employed in the fabrication.

(b) *Girth butt welds.* (1) (Reproduces 127.4.2(a)). Girth butt welds must be complete penetration welds and may be made with a single vee, double vee, or other suitable type of groove, with or without backing rings or consummable inserts.''

(2) Girth butt welds in Class I, I–L, and II–L piping systems shall be double welded butt joints or equivalent single welded butt joints for pipe diameters exceeding three-fourth inch nominal pipe size. The use of a single welded butt joint employing a backing ring